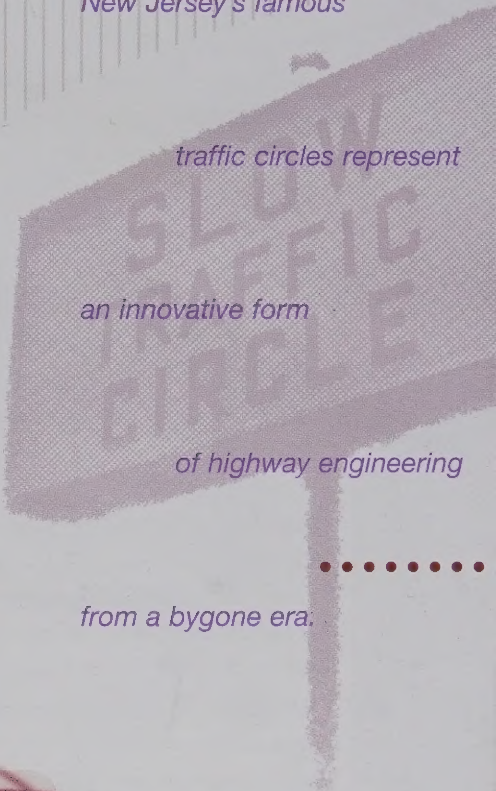
New Jersey's Historic Traffic Circles



New Jersey's famous

traffic circles represent

an innovative form

of highway engineering

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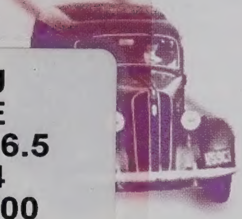
from a bygone era.



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The nation's first traffic circle, Airport Circle, was built in Pennsauken, Camden County, in 1925-1926. Over the next fifteen years, approximately 75 circles were built throughout New Jersey. Although there are no numbers on the subject, it is likely that New Jersey built more traffic circles than any other state. New Jersey's highway engineers experimented with circles, cloverleafs, and a variety of other intersection designs to improve traffic flow in the late 1920s and 1930s. In the 1970s it was recognized that dramatic increases in traffic volume at some circles made it necessary to redesign them.

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History of New Jersey Traffic Circles

Traffic circles developed with the advent of the automobile. Around the turn of the century, in congested cities, some existing circles that housed fountains or monuments were “channelized” to provide a traffic system in the vicinity of the circle. The first circle to have such a one-way rotary system was Columbus Circle in New York City in 1905. During this period, William Phelps Eno (1858-1945), the “father of traffic control” advocated small circles and other devices, such as “silent policemen,” to provide some order to traffic movement at busy intersections. “Silent policemen” were metal posts or columns, often illuminated, that stood in the center of an intersection with signs such as “Go to the Right” and “Go Slowly.” An early, notable example of a small traffic circle, its center island about 30 feet in diameter, was completed in 1916 in Detroit.

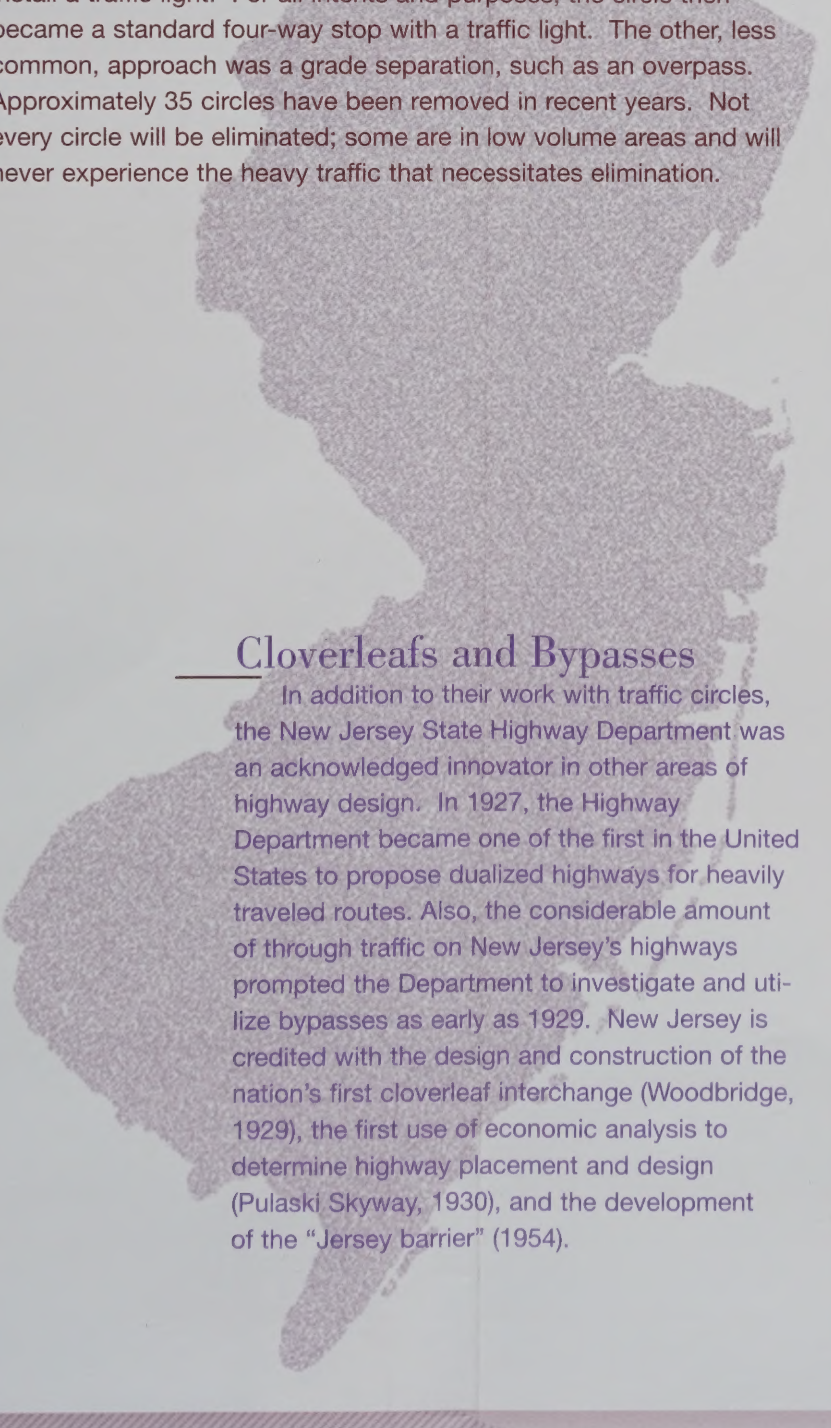
Circles are called roundabouts in England and rotaries in Massachusetts.

As automobile ownership and traffic volumes increased in the 1920s, New Jersey experienced unprecedented traffic pressures from New York, Philadelphia, and shore-bound traffic. The State Highway Department, precursor to the Department of Transportation, adopted new methods and technologies to facilitate the movement of automobile traffic in the state. Intersection design became a major engineering issue. Engineers recognized, during this period of dramatic increases in the number of registered automobiles, miles of paved highway and traffic fatalities, that the worst accidents occurred where two "streams" of traffic crossed each other. Highway engineers developed a variety of "grade separation" schemes to separate traffic streams and reduce accidents. Out of this period of experimentation came a variety of intersection designs, including large, highway-oriented circles and grade separations, such as cloverleafs, partial cloverleafs, and flared intersections. Factors such as topography, property values, and traffic volumes dictated which design was utilized in a specific location. In general, circles were cheaper than grade separations and required less land.

The nation's first large-scale, highway-oriented traffic circle was built in Pennsauken Township, near Camden in 1925-1926. It became known as the Airport Circle in 1929 when the Philadelphia-Camden Airport was established adjacent to the circle. New Jersey highway engineers experimented with all types of rotary intersections and, according to one author, "were not afraid to test their ideas in actual construction." New Jersey's ready use of traffic circles may have resulted from the State Highway Commission's 1926 recommendation that automatic traffic signals be excluded from state highways. The New Jersey State Highway Department built approximately 75 circles near New York, Philadelphia and along major roads to the shore resorts. The last circle was built in 1952 on the Trenton Freeway. The only other state with a significant concentration of traffic circles is Massachusetts.

The first traffic circle (Airport Circle, Pennsauken, 1925-26) was designed for operating speeds of 15 miles per hour.

By the 1950s, traffic circles were no longer seen as an acceptable design solution. Post-war traffic volumes and increased automobile speeds overwhelmed many circles. The Department of Transportation began to eliminate circles in 1975 by two means. The first and more common method was to "cut through" the center of the circle and install a traffic light. For all intents and purposes, the circle then became a standard four-way stop with a traffic light. The other, less common, approach was a grade separation, such as an overpass. Approximately 35 circles have been removed in recent years. Not every circle will be eliminated; some are in low volume areas and will never experience the heavy traffic that necessitates elimination.



Cloverleafs and Bypasses

In addition to their work with traffic circles, the New Jersey State Highway Department was an acknowledged innovator in other areas of highway design. In 1927, the Highway Department became one of the first in the United States to propose dualized highways for heavily traveled routes. Also, the considerable amount of through traffic on New Jersey's highways prompted the Department to investigate and utilize bypasses as early as 1929. New Jersey is credited with the design and construction of the nation's first cloverleaf interchange (Woodbridge, 1929), the first use of economic analysis to determine highway placement and design (Pulaski Skyway, 1930), and the development of the "Jersey barrier" (1954).

Harold W. Giffin

Most, if not all, of the traffic circles built in New Jersey were designed by Harold W. Giffin, an engineer with the New Jersey State Highway Department in the 1920s and 1930s. Giffin published at least five articles in the 1920s and 1930s on grade separations and circle designs. A number of these articles were presented as papers before professional organizations such as the Canadian Good Roads Association, the Harvard University Bureau of Street Traffic Research and the Association of Highway Officials of the North Atlantic States. In his writings, Giffin does not appear to have advocated circles over other forms of intersection improvements. In fact, Giffin anticipated the eventual disfavor found with circles:

"On traffic circles there is still considerable difference of opinion as to the desirable distance between any exit and the next entrance, the proper distance for crossing or weaving, the influence of varying number of crossing lanes, the width required for crossing and the maximum permissible angle for the shortest crossing. We have learned that no matter how poorly the circle is designed it can be made to work after a fashion but we haven't as yet established any measure of workability and efficiency of design. Because some poor designs do work under present traffic conditions it may take years to show how poorly designed they may be."

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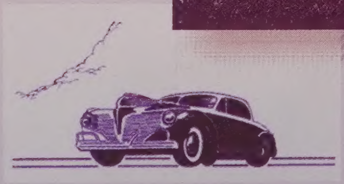

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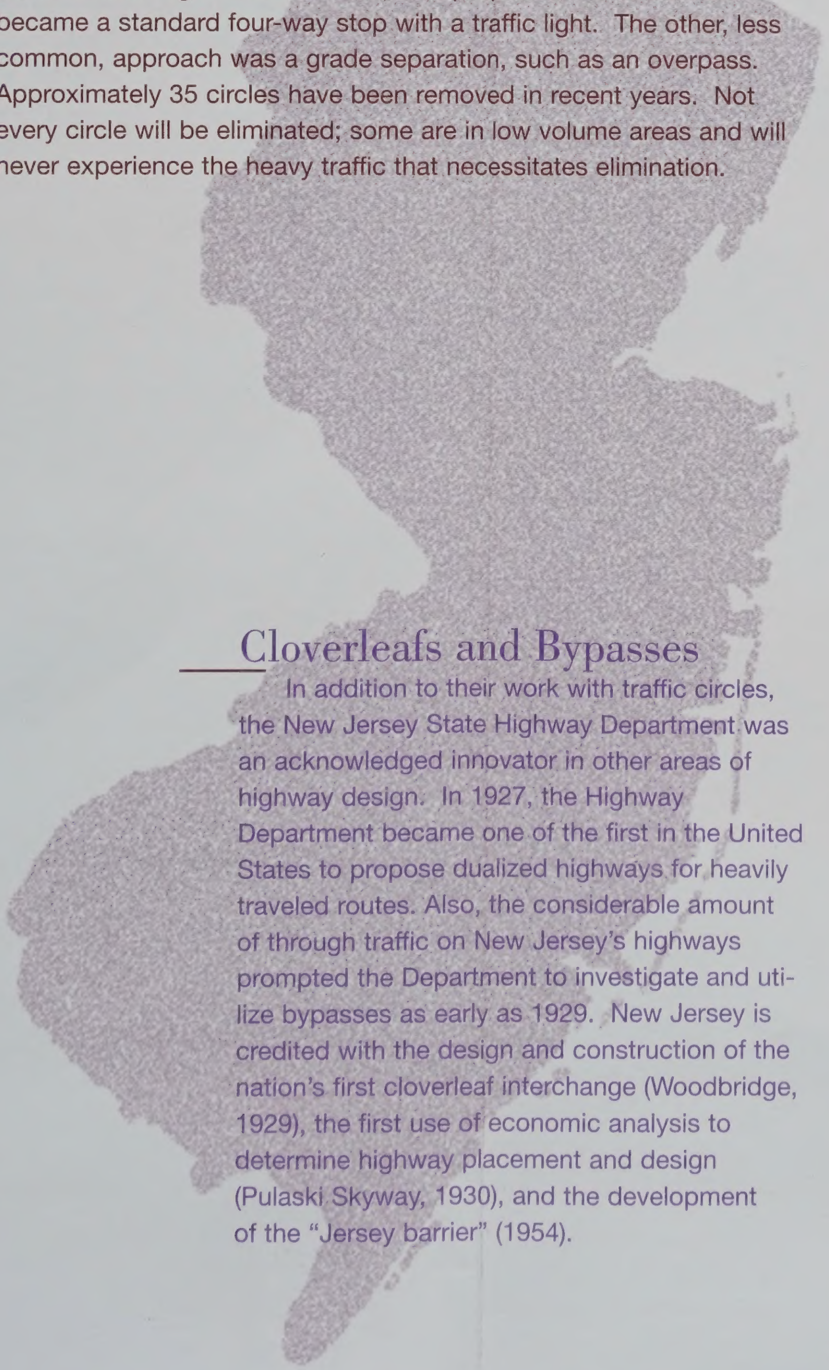

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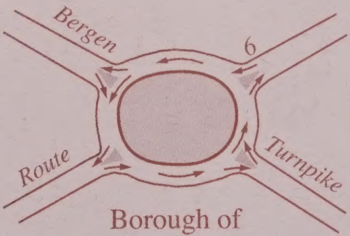
New Jersey Circle Illustrations
Engineering-News Record
November 1931



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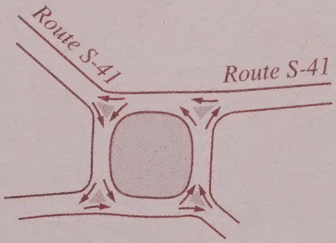
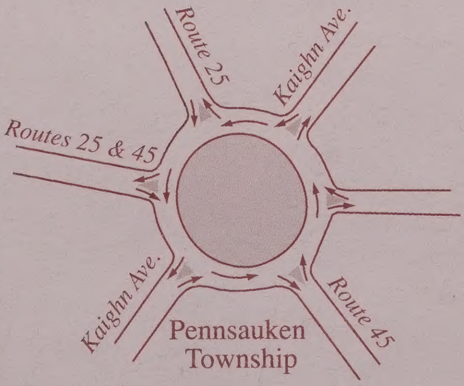
Little Ferry



Berlin



Pennsauken
Township

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2000